

## **CLAIMS**

What is claimed is:

1. A generator of difference information, the generator comprising:  
a first stream of information, the first stream comprising a plurality of first bytes of data;  
a second stream of information, the second stream comprising a plurality of second bytes of data; and  
an array storing operations for tree-based encoding of the first and second streams of information, wherein the generator simultaneously traverses the first and second streams of information, analyzes the plurality of first and second bytes of data encountered in the first and second streams of information, determines difference information between the first and second streams of information, and outputs the difference information between the first and second streams of information.
2. The generator according to claim 1, further comprising a differencing component for computing and expressing the difference information employing a differencing instruction set.
3. The generator according to claim 2, wherein the differencing instruction set comprises at least one operation selected from a match operation, an insert operation, a delete operation, and a replace operation.
4. The generator according to claim 1, further comprising an encoder providing tree-based encoding, the encoder employing a block-based hierarchical representation, and the encoder segmenting blocks during encoding.
5. The generator according to claim 4, wherein the encoder employs variable length encoding techniques for operators in a set of operations, the encoder employing tree-based variable sized blocks, and wherein the generator computes a cumulative address offset.

6. An electronic device network adapted to dispense streaming updates to at least one of a plurality of electronic devices, the updates for updating one of firmware and software, the electronic device network comprising:

a generator generating streaming updates, the generator processing at least one of a plurality of blocks of content, the at least one of a plurality of blocks of content comprising a stream of bytes, the generator processing the at least one of a plurality of blocks of content until reaching an end of the stream of bytes;

a server communicatively coupled to the at least one of a plurality of electronic devices, the server disseminating the streaming updates to the at least one of a plurality of electronic devices; and

a processor in the at least one of a plurality of electronic devices for processing the streaming updates received from the server.

7. The electronic device network according to claim 6, wherein the generator employs an array to store operations used to transform a first stream of information into a second stream of information, the generator processing the first stream and the second stream in a byte-by-byte fashion to generate streaming updates, and each byte is one of a text character and a binary value of at least one of the first and second streams.

8. The electronic device network according to claim 6, wherein the generator maintains a transform array wherein a minimum weight is assigned to a set of operations, the minimum weight being computed by employing an edit distance computation in management of an operational array.

9. The electronic device network according to claim 8, wherein the set of operations comprises at least one of a replace operation, a match operation, an insert operation, and a delete operation.

10. The electronic device network according to claim 6, wherein the generator comprises an encoder for encoding operations, the encoder assigning values to each operation in a set of operations.

11. The electronic device network according to claim 10, wherein the encoder assigns a minimum weight, wherein the minimum weight is computed by employing appropriate weights in management of a transform array.

12. The electronic device network according to claim 11, wherein the encoder assigns numeric values to each operation in the set of operations, wherein non-zero values are assigned to replace operators and insert operators, and zero is assigned to match operators.

13. The electronic device network according to claim 6, wherein the electronic device network is one of a wired and a wireless network.

14. The electronic device network according to claim 6, wherein the streaming updates comprise a difference output for two streams comprising one of binary data and text data, the difference output comprising at least one of a tree map, operational codes for operations comprising at least one of a replace operation, a match operation, a delete operation, and an insert operation, and data characters associated with at least one of the insert operation and the replace operation.

15. The electronic device network according to claim 6, wherein a first stream of information and a second stream of information are processed by the generator, and wherein an operational array is computed in the generator by consuming each of the streams in small chunks, wherein a small chunk comprises one of a 64-byte block of information, a 16-byte block of information, and a 4-byte block of information.

16. The electronic device network according to claim 15, wherein each small chunk of each of the streams is used to define a portion of the operational array, wherein after encoding an operation in an encoder, the encoder reorients to a corresponding point in each of the streams to start additional encoding of a next small chunk.

17. The wireless electronic device network according to claim 6, wherein the electronic device comprises at least one of a plurality of mobile electronic devices, and wherein the plurality of mobile electronic devices comprise at least one of a mobile cellular phone handset, a personal digital assistant, a pager, a multimedia device, and a camera.

18. A method of generating streaming updates by converting a first stream of information into a second stream of information for updating an electronic device, the method comprising:

- identifying the first and second streams of information;
- accessing the first and second streams of information;
- retrieving one block of content at a time from each of the first and the second streams of information;
- determining a transform operation; and
- executing the transform operation.

19. The method according to claim 18, further comprising:

- computing an output from the transform operation;
- creating a tree-based transform output from operators determined in the transform;

- encoding the tree-based transform output employing at least one of variable length encoding and fixed length encoding; and
- outputting difference information into at least one memory structure.

20. The method according to claim 19, further comprising:

- determining whether additional blocks of content are to be processed by evaluating the first and second streams of information;
- retrieving an additional block of content from each of the first and the second streams of information upon determining that additional blocks of content are to be encoded; and
- continuing encoding until reaching an end of a stream of blocks of content to be encoded.

21. The method according to claim 20, further comprising:  
compressing difference information output; and  
packaging the difference information output into an update.
22. The method according to claim 18, further comprising:  
buffering content from the first stream of information and the second stream  
information to determine the difference information; and  
encoding the difference information before outputting the difference information.
23. The method according to claim 18, wherein the update facilitates  
conversion of the first stream of information into the second stream of information,  
wherein retrieving blocks of content from the second stream of information is performed  
at a fixed pace using a fixed block size, and wherein retrieving blocks of content from the  
first stream of information is performed at a variable pace using a variable block size,  
wherein a reference to the second stream of information is maintained and a cumulative  
offset is computed.
24. The method according to claim 18, wherein a look-ahead operation is  
executed as part of retrieving blocks of content, the look-ahead operation employing data  
from the first and second streams of information to compute an operational array.
25. The method according to claim 18, wherein a longest common sub-string  
technique is employed prior to determining a transform operation.
26. The method according to claim 18, wherein illegal an unexpected  
operation codes are employed as an escape sequence during encoding.
27. The method according to claim 26, wherein a combination of the escape  
sequence, a type field of two bits, and a length representing a repetition of data associated  
with the type field is employed by to encode long strings of complete matches between  
the first and second streams of information.

28. The method according to claim 18, wherein the electronic device comprises at least one of a plurality of mobile electronic devices, and wherein the plurality of mobile electronic devices comprise at least one of a mobile cellular phone handset, a personal digital assistant, a pager, a multimedia device, and a camera.